Chapter 7

Usability Heuristics for Mobile Phone Applications: A Literature Review

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ABSTRACT

In this chapter, we discuss the importance of evaluating the usability of mobile applications using tools and technics that consider their specific characteristics. One common way to evaluate usability is using heuristics. However, since many assumptions regarding usability of computer applications are not true for mobile applications, a question arises: does there exist usability heuristics specific for this type of device? To answer this question, we conducted a systematic literature review. We mapped the encountered sets of heuristics to Nielsen’s ten heuristics and identified additional ones specifically proposed for this kind of device. Our review indicates that research with respect to usability heuristics for mobile phones are still sparse. Nevertheless, this chapter provides an overview on the state of the art that can guide the design and evaluation of interfaces for mobile applications as well as provide a starting point for the evolution of such customized heuristics.

INTRODUCTION

Mobile phones have world-wide become the most popular and widespread personal consumer device (International Telecommunication Union (ITU, 2011). These mobile phones that we now carry with us all the time have drastically evolved from a simple device to make phone calls to a complex interactive multimedia system with access to the Internet for a wide number of purposes. And currently, the percent-

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The age of smartphones – especially touch-enabled phones (Lee, 2011) and mobile applications (Nielsen, 2012) – is growing strongly worldwide. Yet, so far, we know little about “what works” in the interface design for mobile (touch) phone applications. In this paper, mobile (touch) phones are understood as smartphones that offer a greater level of computability and connectivity than feature phones and that allow interaction through a touch-sensible screen (Litchfield, 2010). Due to a lack of knowledge on this new kind of device, designers try to apply the best available knowledge from GUI or web-based interface design. However, the question is to which regard this can be applied to the design problem at hand, as many of the assumptions about user interactions known from “traditional” computer usage do not hold true for mobile devices (Wasserman, 2010; Bertini et al., 2009). Clearly, the size and portability requirements of mobile phones present limitations as well as the awkward ways for data input. And, although touch screen capabilities may facilitate certain actions, they also pose new challenges through the lack of tactile feedback, touch key size, etc. (Balagtas-Fernandez, Forrai, & Hussmann, 2009). Mobile phones also change traditional interaction models based on the familiar WIMP (Windows, Icons, Menus, Pointer) interface style to interaction that may involve voice, gesture, sensors and location data (Wasserman, 2010). Differences are also related to the environment, as mobile users will not be sitting quietly at a desk for a long time. They are rather on the go, walking down the street or waiting at the bus stop seeking to quickly complete simple tasks, to retrieve information or to be entertained by assisting videos or playing games in environments where they will be surrounded by other stimuli. Interface design is further complicated since mobile phones are used by a wide range of people with different backgrounds and goals (Huang, 2009). Furthermore, the fragmentation of the mobile market contributes to a lack of consistency that makes mobile phones more difficult to use (Park, Han, Kang, Park, & Chun, 2011). Consequently, consumers are increasingly experiencing frustration with the usage of mobile phones (Norman, 2005).

Considering that usability is one of the main factors to a software’s success (Bias & Mayhew, 2005) and with the challenge of making the best possible use of touch phones considering their specific characteristics and limitations, user interface design takes on greater importance than ever (Wasserman, 2010). It is crucial to develop interactive mobile products that are usable, which means that they are effective and efficient to use and that they provide an enjoyable user experience. A way to conceptualize usability is in terms of design principles or heuristics (Preece, Rogers, & Sharp, 2011). Usability heuristics represent general principles for designing interfaces. A well-known example is the heuristic “visibility of system status” expressing that the system should always keep users informed about what is going on. Usability heuristics are derived from a mix of theory-based knowledge, experience and common sense. They are typically refined into design guidelines in style guides, which in a more detailed prescriptive manner specify exactly how to design an actual interface (for example, on how to design a particular icon) or serve as a checkpoint to evaluate the compliance of an interface design in order to identify potential usability problems. Usability heuristics, therefore, are intended to help designers to develop and improve the design as well as to provide a basis for evaluating prototypes and existing systems (Preece, Rogers, & Sharp, 2011). In particular, they provide a framework for heuristic evaluation (Nielsen & Molich, 1990), a lightweight usability inspection method for finding usability problems at any point during the development process requiring little time and human resources.

However, in order to provide valid feedback, heuristics used as basis for the development and/or evaluation have to represent correct principles for interface design. There are various sets of usability heuristics available that have originally been developed for GUIs on desktop computers. Among the